



## **Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents**

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**Table 6. Common or Serious Adverse Reactions Associated With Drugs Used for Preventing or Treating Opportunistic Infections** (page 1 of 5) (Last updated May 7, 2013; last reviewed May 7, 2013)

Drugs	Common or Serious Adverse Reactions
<b>Acyclovir</b>	Generally well-tolerated. Crystalluria (with high dose or pre-existing renal impairment), neurotoxicity (high doses, especially in patients with renal impairment; agitation, confusion, hallucination, seizure, coma), nephrotoxicity secondary to obstructive urolithiasis (particularly after rapid IV infusion), thrombophlebitis at peripheral IV infusion site, nausea, vomiting, headache
<b>Adefovir</b>	Generally well-tolerated. Nephrotoxicity with underlying renal insufficiency, nausea, asthenia
<b>Albendazole</b>	Nausea, vomiting, hepatotoxicity, hypersensitivity reaction, dizziness, headache, reversible alopecia  Rarely: granulocytopenia, agranulocytosis, or pancytopenia
<b>Amikacin</b>	Nephrotoxicity, ototoxicity (both hearing loss and vestibular toxicity are possible), neuromuscular blockade (associated with rapid infusion of large aminoglycoside doses), pain upon IM injection
<b>Amoxicillin/Clavulate and Ampicillin/Sulbactam</b>	Diarrhea, nausea, vomiting, abdominal pain, <i>Clostridium difficile</i> -associated diarrhea and colitis, hypersensitivity reactions (immediate or delayed reactions including anaphylaxis), bone marrow suppression, drug fever, neurotoxicity at high doses (especially in patients with renal dysfunction)
<b>Amphotericin B Deoxycholate and Lipid Formulations</b>	Nephrotoxicity, infusion-related reactions (fever, chills, rigors, back pain, hypotension), hypokalemia, hypomagnesemia, anemia, thrombophlebitis, nausea, vomiting  Liposomal formulations have lower incidence of nephrotoxicity and infusion-related reactions.
<b>Anidulafungin</b>	Generally well-tolerated. Hepatotoxicity, histamine-related infusion reactions (flushing, rash, pruritus, hypotension, dyspnea; rare if infusion rate <1.1 mg/min), hypokalemia, diarrhea
<b>Artemether/Lumefantrine</b>	Generally well-tolerated. Rash, pruritus, nausea, vomiting, abdominal pain, anorexia, diarrhea, arthralgia, myalgia, dizziness, headache, hemolytic anemia (rare), QTc prolongation
<b>Artesunate</b>	Generally well-tolerated. Bradycardia, dizziness, nausea and vomiting, skin rash, pruritus
<b>Atovaquone</b>	Rash, nausea, vomiting, diarrhea, hepatotoxicity, headache, hyperglycemia, fever
<b>Atovaquone/Proguanil</b>	Pruritus, rash, nausea, vomiting, abdominal pain, diarrhea, anorexia, EM, asthenia, dizziness, headache, oral ulcers, hepatotoxicity
<b>Azithromycin</b>	Nausea, vomiting, diarrhea, hepatotoxicity, ototoxicity (with prolonged use), rash, urticaria, pruritus, abdominal pain; risk of torsades de pointes, use with caution in patients with underlying QTc prolongation
<b>Aztreonam</b>	Diarrhea, hypersensitivity reaction (rare), thrombophlebitis
<b>Benznidazole</b>	Photosensitivity, allergic dermatitis, paresthesia, peripheral neuropathy, nausea, vomiting, abdominal pain, anorexia, weight loss
<b>Boceprevir</b>	Anemia, neutropenia, dysgeusia, dry mouth, nausea, headache, acute hypersensitivity reaction (urticarial, angioedema; rare)
<b>Capreomycin</b>	Nephrotoxicity, ototoxicity (both hearing loss and vestibular toxicity are possible), neuromuscular blockade (associated with rapid infusion of large aminoglycoside doses), pain upon IM injection
<b>Caspofungin</b>	Generally well-tolerated. Fever, thrombophlebitis, histamine-related infusion reactions (flushing, rash, pruritus, facial swelling, hypotension, dyspnea), hypokalemia, anemia, headache, hepatotoxicity
<b>Ceftriaxone</b>	Generally well-tolerated. Cholelithiasis, rash, diarrhea, drug fever, <i>C. difficile</i> -associated diarrhea and colitis; IM injections: injection-site reactions, pain

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Drugs	Common or Serious Adverse Reactions
<b>Cephalosporins</b>	Hypersensitivity reaction, rash, nausea, vomiting, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, bone marrow suppression, CNS toxicities such as seizure and confusion (rare, mostly seen with high dose used in patients with renal insufficiency or elderly patients without dosage adjustment)
<b>Chloroquine and Hydroxychloroquine</b>	Headache, pruritus, skin pigmentation, nausea, vomiting, abdominal pain, diarrhea, anorexia, photosensitivity, visual disturbances, QTc prolongation, neuromyopathy (rarely with long-term use); hemolysis (with G6PD deficiency); hypersensitivity reaction (including TEN, SJS, and EM)
<b>Cidofovir</b>	Nephrotoxicity, proteinuria, ocular hypotony, anterior uveitis/iritis, neutropenia, metabolic acidosis, asthenia.  Side effects most likely related to co-administration of probenecid: rash, nausea, vomiting, anorexia
<b>Ciprofloxacin</b>	Nausea, vomiting, abdominal pain, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, headache, dizziness, sleep disturbances, tendonitis and tendon rupture (associated age >60 and concomitant steroid use), photosensitivity, hypoglycemia, hepatotoxicity, QTc prolongation, neurotoxicity (especially with high doses, use in elderly patients, or in patients with renal dysfunction), seizures (rare)
<b>Clarithromycin</b>	Hepatotoxicity, ototoxicity (with high doses or prolonged use), headache, nausea, vomiting, abdominal cramps, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, rash, QTc prolongation
<b>Clindamycin</b>	Nausea, vomiting, abdominal pain, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, rash, arrhythmia associated with rapid IV infusion
<b>Clotrimazole (Troche)</b>	Generally well-tolerated. Nausea, vomiting, anorexia, metallic taste, increase in serum transaminases (rare)
<b>Cycloserine</b>	Neuropsychiatric toxicities (headache, somnolence, lethargy, vertigo, tremor, dysarthria, irritability, confusion, paranoia, psychosis), seizures
<b>Dapsone</b>	Methemoglobinemia, hemolytic anemia (especially in patients with G6PD deficiency), neutropenia, rash, sulfone syndrome (fever, exfoliative dermatitis, lymphadenopathy, hepatic necrosis, hemolysis), peripheral neuropathy, hepatotoxicity
<b>Doxycycline</b>	Photosensitivity reaction, nausea, vomiting, diarrhea, esophageal ulceration, thrombophlebitis (with IV infusion)
<b>Emtricitabine</b>	Generally well-tolerated. Headache, nausea, hyperpigmentation, diarrhea, rash
<b>Entecavir</b>	Generally well-tolerated. Headache, fatigue, dizziness, nausea
<b>Erythromycin</b>	Nausea, vomiting, abdominal pain, hepatotoxicity, cholestatic jaundice, ototoxicity (hearing loss, tinnitus), rash, QTc prolongation and cardiac arrhythmia
<b>Ethambutol</b>	Optic neuritis (dose dependent), peripheral neuropathy, headache, nausea, vomiting, anorexia, hepatotoxicity, hyperuricemia, hypersensitivity reaction
<b>Ethionamide</b>	Gastrointestinal side effects (dose related): nausea, vomiting, diarrhea, abdominal pain, metallic taste, anorexia; dizziness, drowsiness, depression, hepatotoxicity, hypothyroidism (with or without goiter), gynecomastia
<b>Famciclovir</b>	Generally well-tolerated. Headache, nausea, vomiting, diarrhea
<b>Flucytosine</b>	Concentration-dependent bone marrow suppression (anemia, neutropenia, thrombocytopenia), diarrhea, nausea, vomiting, rash

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Drugs	Common or Serious Adverse Reactions
<b>Fluconazole</b>	Hepatotoxicity, rash, nausea, vomiting, diarrhea, abdominal discomfort, reversible alopecia (with doses $\geq 400$ mg/d for $>2$ months)
<b>Foscarnet</b>	Nephrotoxicity, electrolyte imbalances (hypocalcemia, hypomagnesemia, hypophosphatemia, hyperphosphatemia, hypokalemia), penile ulceration, nausea, vomiting, anorexia, headache, seizure (associated with electrolyte imbalances), anemia, injection-site associated thrombophlebitis
<b>Fumagillin (Investigational)</b>	<u>Oral therapy</u> : Neutropenia, thrombocytopenia, vertigo, nausea, vomiting, diarrhea, anorexia, abdominal cramps <u>Ocular therapy</u> : Minimal systemic effect or local effect
<b>Ganciclovir</b>	Neutropenia, thrombocytopenia, anemia, injection-site-associated thrombophlebitis, confusion
<b>Imipenem/Cilastatin</b>	Hypersensitivity reaction (immediate or delayed); CNS effects—seizure, myoclonus, confusion (more frequent with imipenem than meropenem and dorepenem [especially with higher doses, in patients with underlying CNS disorders, or with renal insufficiency]), nausea, vomiting, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, thrombophlebitis, headache, bone marrow suppression, drug fever
<b>Interferon-Alfa and Peginterferon-Alfa</b>	Influenza-like syndrome (fever, headache, fatigue, and myalgia), neuropsychiatric disorders (depression and suicidal ideation), neutropenia, anemia, thrombocytopenia, thyroid dysfunction, injection-site reactions, alopecia, nausea, anorexia, diarrhea, weight loss, development or exacerbation of autoimmune disorders, ocular effects (retinal hemorrhage, retinal artery or vein obstructions, and cotton wool spots)
<b>Isoniazid</b>	Hepatotoxicity, peripheral neuropathy, optic neuritis, psychosis (rare)
<b>Itraconazole</b>	Hepatotoxicity, congestive heart failure, edema, hypokalemia, nausea, vomiting, diarrhea, abdominal pain, rash
<b>Lamivudine</b>	Generally well-tolerated. Nausea, vomiting
<b>Levofloxacin</b>	Nausea, vomiting, abdominal pain, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, headache, dizziness, sleep disturbances, tendonitis and tendon rupture (associated $>60$ years of age and concomitant steroid use), photosensitivity, hypoglycemia, hepatotoxicity, QTc prolongation, neurotoxicity (especially with high doses, use in elderly patients, or in patients with renal dysfunction), seizures (rare)
<b>Linezolid</b>	Anemia, neutropenia, thrombocytopenia (especially with $>2$ - to 4-week treatment), peripheral neuropathy, optic neuritis with long-term (months) therapy, serotonin syndrome (especially in patients receiving concomitant serotonergic agents), seizure (in patients with a history of seizure or with risk factors for seizure), lactic acidosis (rare)
<b>Mefloquine</b>	Depression, psychosis, rash (reports of TEN and SJS), nausea, vomiting, diarrhea, epigastric pain, agitation, dizziness, headache, insomnia, abnormal dreams, QTc prolongation, arrhythmias (extrasystole, sinus bradycardia)
<b>Meropenem</b>	Generally well-tolerated. Hypersensitivity reaction (immediate or delayed), nausea, vomiting, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, thrombophlebitis, headache, bone marrow suppression, drug fever
<b>Micafungin</b>	Generally well-tolerated. Histamine-related infusion reactions (such as flushing, rash, pruritus, hypotension, dyspnea) may occur, but it is rare if infused over 1 hour; anaphylaxis and anaphylactoid reaction; hepatotoxicity, thrombophlebitis, nausea, vomiting, diarrhea, hypokalemia, hemolysis (rare)

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Drugs	Common or Serious Adverse Reactions
<b>Miconazole Buccal Tablets</b>	Dysgeusia, diarrhea, nausea, vomiting, upper abdominal pain, headache, local reactions (oral discomfort, burning, pain, tongue/mouth ulceration, gingival pruritus, pain and swelling, dry mouth), hypersensitivity reaction (rare—may occur in patients with known hypersensitivity reaction to milk product concentrate)
<b>Miltefosine</b>	Nausea, vomiting, diarrhea, leukocytosis, thrombocytosis, nephrotoxicity, retinal degeneration
<b>Moxifloxacin</b>	Nausea, vomiting, abdominal pain, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, headache, dizziness, sleep disturbances, tendonitis and tendon rupture (associated >60 years of age and concomitant steroid use), photosensitivity, hypoglycemia, hepatotoxicity, QTc prolongation, neurotoxicity (especially with high doses, use in elderly patients, or in patients with renal dysfunction), seizures (rare)
<b>Nifurtimox</b>	Anorexia, weight loss, nausea, vomiting, abdominal pain, headache, dizziness, mood changes, insomnia, myalgia, peripheral neuropathy, rash, pruritus, memory loss
<b>Nitazoxanide</b>	Generally well-tolerated. Nausea, vomiting, diarrhea, abdominal pain, headache
<b>Nystatin (Oral Preparations)</b>	Unpleasant taste, nausea, vomiting, anorexia, diarrhea, hypersensitivity reaction (rare)
<b>Penicillin G</b>	<u>All Penicillin G Preparations:</u> Hypersensitivity reactions (immediate or delayed reactions, including anaphylaxis), bone marrow suppression, nausea, vomiting, diarrhea, <i>C. difficile</i> -associated diarrhea and colitis, drug fever  <u>Benzathine Penicillin G &amp; Procaine Penicillin G:</u> IM injection-site reactions (pain and erythema)  <u>Aqueous Crystalline Penicillin G (IV):</u> Thrombophlebitis, neurotoxicity at high doses (especially in patients with renal dysfunction)
<b>Pentamidine</b>	<u>IV Infusion:</u> Nephrotoxicity, infusion-related hypotension, thrombophlebitis, arrhythmias (including torsades de pointes), pancreatitis, hypoglycemia, hyperglycemia, diabetes mellitus, hepatotoxicity, electrolyte abnormalities, leukopenia, thrombocytopenia  <u>Aerosolized Therapy:</u> Bronchospasm, cough, dyspnea, tachypnea, metallic taste, pancreatitis (rare)
<b>Pentavalent Antimony (Sodium Stibogluconate)</b>	Nausea, vomiting, abdominal pain, anorexia, pancreatitis (rare), headache, hepatotoxicity, arthralgia, myalgia, cardiac toxicity with higher than 20 mg/kg dose, rash, thrombophlebitis, leukopenia, anemia, thrombocytopenia
<b>Posaconazole</b>	Nausea, vomiting, diarrhea, abdominal pain, headache, hepatotoxicity, hypokalemia, QTc prolongation, rash
<b>Piperacillin-Tazobactam</b>	Generally well-tolerated. Hypersensitivity reaction, rash, diarrhea, nausea, vomiting, <i>C. difficile</i> -associated diarrhea and colitis, thrombophlebitis, thrombocytopenia (rare), impaired platelet aggregation, seizure (high dose in patients with renal insufficiency)
<b>Primaquine</b>	Methemoglobinemia, hemolytic anemia (especially in patients with G6PD deficiency), leukopenia, neutropenia, abdominal cramps, nausea, vomiting
<b>Pyrazinamide</b>	Hepatotoxicity, hyperuricemia, arthralgia, nausea, vomiting
<b>Pyrimethamine</b>	Neutropenia, thrombocytopenia, megaloblastic anemia, rash
<b>Quinidine Glucuronate</b>	QTc prolongation, lightheadedness, nausea, vomiting, diarrhea, abdominal pain, drug-induced SLE, headache, rash, hemolysis (with G6PD deficiency), hepatotoxicity
<b>Quinine</b>	Headache, nausea, vomiting, diarrhea, cinchonism (tinnitus, vertigo, blurred vision), hypersensitivity reaction

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Drugs	Common or Serious Adverse Reactions
<b>Ribavirin</b>	Hemolytic anemia, dyspnea, hyperbilirubinemia, nausea, vomiting, anorexia, dyspepsia, rash, dry cough
<b>Rifabutin</b>	Hepatotoxicity, uveitis (dose dependent), red-orange discoloration of body fluids, rash, arthralgia, neutropenia, nausea, vomiting, abdominal pain, diarrhea, anorexia
<b>Rifampin</b>	Hepatotoxicity (cholestatic hepatitis), red-orange discoloration of body fluids, thrombocytopenia, hemolytic anemia, rash, hypersensitivity reactions with flu-like syndrome, nausea, vomiting, anorexia, abdominal pain, flatulence, diarrhea, renal failure
<b>Streptomycin</b>	Nephrotoxicity, ototoxicity (both hearing loss and vestibular toxicity are possible), pain upon IM injection
<b>Sulfadiazine</b>	Rash (including SJS, EM, TEN), anemia, neutropenia, thrombocytopenia, crystalluria with or without urolithiasis, renal insufficiency, nausea, vomiting, drug fever, hepatotoxicity
<b>Telaprevir</b>	Anemia, rash, pruritus, nausea, vomiting, dysgeusia, diarrhea, ano-rectal discomfort (hemorrhoid, pruritus), proctitis, severe cutaneous eruption (including SJS, EM, TEN)
<b>Telbivudine</b>	Generally well-tolerated. Nausea, vomiting, abdominal pain, increase in creatine kinase, headache, dizziness
<b>Tenofovir</b>	Renal insufficiency, proximal renal tubulopathy (with hypophosphatemia, hypouricemia, normoglycemic glycosuria), decrease in bone mineral density, nausea
<b>Tetracycline</b>	Photosensitivity, tooth discoloration if taken by infants and children, pruritus, esophageal ulceration, nausea, vomiting, diarrhea, hepatotoxicity, rash
<b>Trimethoprim-Sulfamethoxazole</b>	Rash (including SJS, EM, and TEN), photosensitivity, anemia, neutropenia, thrombocytopenia, hepatotoxicity, increase in serum creatinine (without change in GFR), interstitial nephritis, nausea, vomiting, crystalluria (in patients with inadequate hydration), hyperkalemia (more common with high dose TMP), drug fever
<b>Valacyclovir</b>	Generally well-tolerated. Nausea, vomiting, headache, crystalluria (with high dose or renal impairment), neurotoxicity (high doses, especially in patients with renal impairment; agitation, confusion, hallucination, seizure, coma)
<b>Valganciclovir</b>	Neutropenia, thrombocytopenia, anemia, nausea, vomiting, diarrhea, confusion
<b>Vancomycin</b>	Infusion-related reaction (infusion-rate related, flushing, hypotension, rash), thrombophlebitis, rash, neutropenia, thrombocytopenia (rare), ototoxicity (associated with excessive concentration), nephrotoxicity (associated with high daily dose and high trough concentrations)
<b>Voriconazole</b>	Visual disturbances (with initial dosing), optic neuritis (with >28 days treatment), skin photosensitivity, rash, hepatotoxicity, peripheral edema, headache, delirium, hallucination, encephalopathy (associated with trough >5.5 mcg/mL), QTc prolongation, peripheral neuropathy (rare)

**Key to Acronyms:** CNS = central nervous system; EM = erythema multiforme; G6PD = glucose-6-phosphate dehydrogenase; GFR = glomerular filtration rate; IM = intramuscular; IV = intravenous; SJS = Stevens-Johnson syndrome; SLE = systemic lupus erythematosus; TEN = toxic epidermal necrolysis; TMP = trimethoprim